Name #1-4, 9-14, 16 Class _____ Date _____

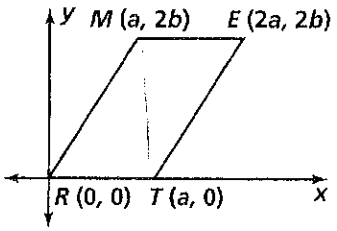
on back #1, 3

Practice 6-6

Placing Figures in the Coordinate Plane

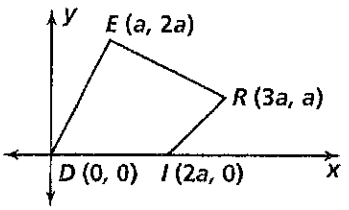
Find the coordinates of the midpoint of each segment and find the length of each segment.

1. $\overline{ME}$ $\left(\frac{3a}{2}, 2b\right)$; a
2. $\overline{ET}$ $\left(\frac{3a}{2}, b\right)$; $\sqrt{a^2+4b^2}$ $\sqrt{a^2+(2b)^2}$
3. $\overline{TR}$ $\left(\frac{a}{2}, 0\right)$; a
4. $\overline{RM}$ $\left(\frac{a}{2}, b\right)$; $\sqrt{a^2+4b^2}$

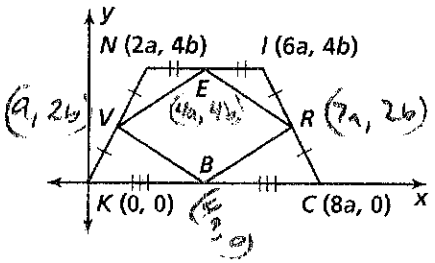


Find the slope of each segment.

5. $\overline{DI}$
6. $\overline{IR}$
7. $\overline{RE}$
8. $\overline{DE}$

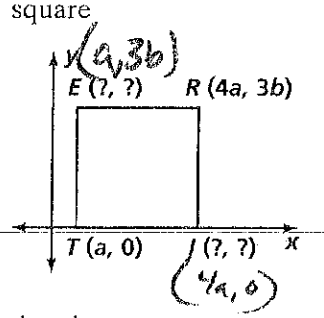


9. $\overline{VE}$ $m = \frac{2b}{3a}$
10. $\overline{ER}$ $m = \frac{-2b}{5a}$
11. $\overline{RB}$ $\longrightarrow$ $m = \frac{2b}{3a}$
12. $\overline{VB}$ $\longrightarrow$ $m = \frac{-2b}{3a}$

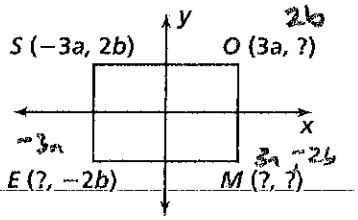


Use the properties of each figure to find the missing coordinates.

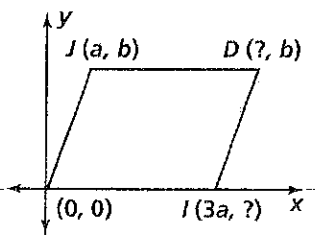
13. square



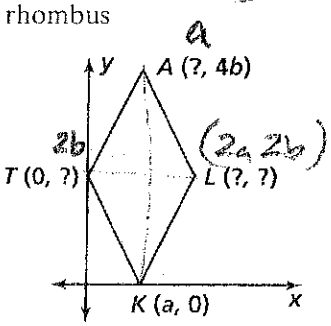
14. rectangle



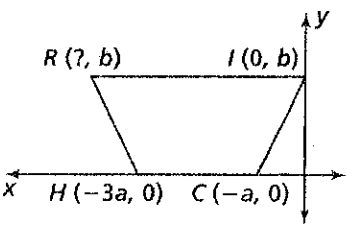
15. parallelogram



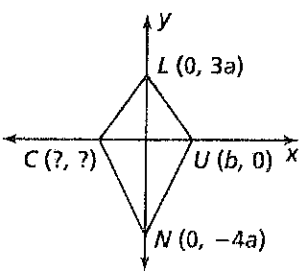
16. rhombus



17. isosceles trapezoid



18. kite

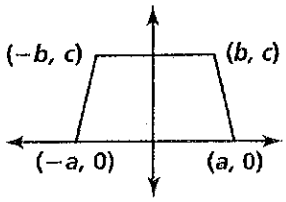


#1, 3

Exercises

Use coordinate geometry and the figures provided to prove the theorems.

1. Diagonals of an isosceles trapezoid are congruent.

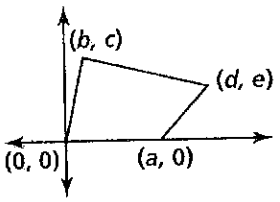


$d_1 = \sqrt{(b+a)^2 + (c-0)^2} = \sqrt{(a+b)^2 + c^2}$

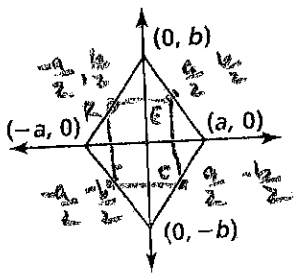
$d_2 = \sqrt{(a+b)^2 + (0-c)^2} = \sqrt{(a+b)^2 + c^2}$

∴ diagonals are ≅

2. The segments joining the midpoints of a quadrilateral form a parallelogram.



3. The segments joining the midpoints of a rhombus form a rectangle.



Prove RECT is ▱ then Rectangle

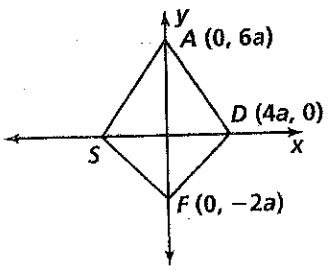
$\overline{RC}$ M (0, 0) ✓ diagonals bisect each other so ▱

$\overline{ET}$ M (0, 0) ✓

$RC = \sqrt{\left(\frac{a}{2}+\frac{a}{2}\right)^2 + \left(\frac{-b}{2}-\frac{b}{2}\right)^2} = \sqrt{a^2+b^2}$ diagonals ≅, so Rect.

$ET = \sqrt{\left(\frac{a}{2}+\frac{a}{2}\right)^2 + \left(\frac{b}{2}+\frac{b}{2}\right)^2} = \sqrt{a^2+b^2}$

4. *ADFS* is a kite.
   - **a.** Determine the coordinates of *S*.
   - **b.** Find the midpoint of $\overline{AS}$.
   - **c.** Find the slope of $\overline{AS}$.
   - **d.** Find the midpoint of $\overline{DF}$.
   - **e.** Find the slope of $\overline{DF}$.

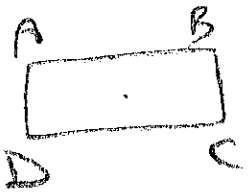


Name #1-15, 18, 20-22, 24, 25 Date _____

LESSON 8.6

Practice C

For use with pages 552–557



Draw the sides or diagonals of *ABCD* as described. What special type of quadrilateral is *ABCD*?

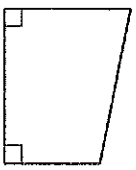
1. $\overline{AC} \cong \overline{BD}$, $\overline{AC}$ and $\overline{BD}$ bisect one another, but $\overline{AC}$ is not perpendicular to $\overline{BD}$. Rect
2. $\overline{AB} \cong \overline{BC}$ and $\overline{CD} \cong \overline{DA}$, but $\overline{BC} \ncong \overline{CD}$. Kite
3. $\overline{AB} \parallel \overline{CD}$ and $\overline{BC} \cong \overline{DA}$. Isos Trap
4. $\overline{AC} \perp \overline{BD}$, $\overline{AC}$ and $\overline{BD}$ bisect one another, but $\overline{AC} \ncong \overline{BD}$. Rhombus
5. $\overline{AC} \perp \overline{BD}$, $\overline{AC}$ and $\overline{BD}$ bisect one another, and $\overline{AC} \cong \overline{BD}$. Sq unless

Determine whether the statement is *always*, *sometimes*, or *never* true.

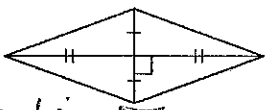
6. Diagonals of a trapezoid are congruent. S
7. Opposite sides of a rectangle are congruent. A
8. A square is a rectangle. A
9. A square is not a rhombus. N
10. All angles of a parallelogram are congruent. S
11. Opposite angles of an isosceles trapezoid are congruent. N
12. The diagonals of a parallelogram are perpendicular. S

Tell whether enough information is given in the diagram to classify the quadrilateral by the indicated name. *Explain.*

13. Trapezoid yes one pair ∥ sides

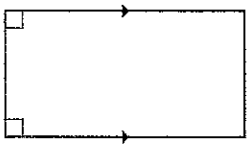


14. Rhombus yes



diags bis. ▱
diag ⊥ Rhombus

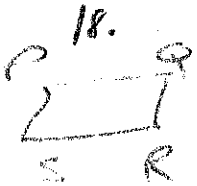
15. Rectangle No



Points *P*, *Q*, *R*, and *S* are the vertices of a quadrilateral. Give the most specific name for *PQRS*. *Justify* your answer.

16. $P(-1, 3)$, $Q(4, 2)$, $R(1, -1)$, $S(-4, 0)$
17. $P(-3, 5)$, $Q(-7, 6)$, $R(-9, -2)$, $S(-5, -3)$
18. $P(-2, 9)$, $Q(-2, -1)$, $R(-5, 5)$, $S(-5, 7)$
19. Use the quadrilateral in Exercise 17. Find the midpoint of each side. Connect the midpoints to form a new quadrilateral. What kind of quadrilateral is formed?

18.



$\overline{PQ}$ $m = \frac{10}{0}$ undef

$\overline{RS}$ $m = \frac{2}{0}$ undef

$\overline{PQ} \parallel \overline{RS}$

$PS = \sqrt{(3)^2 + (2)^2} = \sqrt{13}$

$\overline{PS}$ $m = \frac{2}{3}$

not ∥

$QR = \sqrt{9 + 36} = \sqrt{45}$

$\overline{QR}$ $m = \frac{6}{-3}$

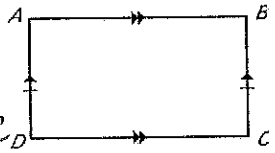
∴ Trapezoid only 1 pair ∥ sides

Name _____ Date _____

LESSON 8.6 **Practice C** *continued*
For use with pages 552–557

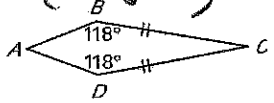
Which pairs of segments or angles must be congruent so that you can prove that *ABCD* is the indicated quadrilateral? *Explain.* There may be more than one right answer.

20. Rectangle

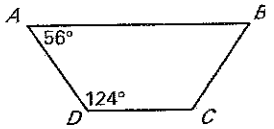


either $\overline{AC} \cong \overline{BD}$ (≅ diagonals) or $\angle A \cong \angle D \cong \angle B \cong \angle C$

21. Kite $\overline{AB} \cong \overline{AD}$ (def of kite)

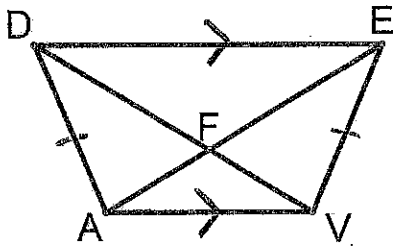


22. Isosceles Trapezoid $\overline{AD} \cong \overline{BC}$



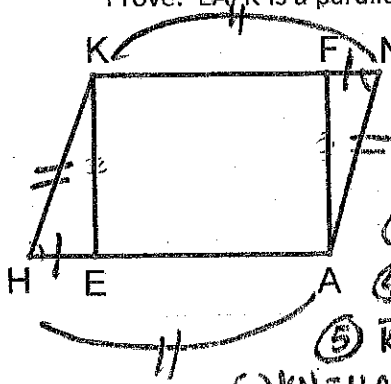
23. Let *ABCD* be a quadrilateral with $\overline{AB} \cong \overline{BC}$, $\overline{CD} \cong \overline{DA}$, and $\overline{AB} \parallel \overline{CD}$. What type of quadrilateral is *ABCD*? *Verify* your answer by completing the proof.

Statements	Reasons
1. Draw $\overline{AC}$.	1. ?
2. $\overline{AB} \cong \overline{BC}$, $\overline{CD} \cong \overline{DA}$	2. ?
3. ?	3. Base Angles Theorem
4. ?	4. Given
5. $\angle CAB \cong \angle ACD$	5. ?
6. ?	6. Transitive Prop. of Congruence
7. $\overline{AC} \cong \overline{AC}$	7. ?
8. ?	8. ASA Congruence Postulate
9. $\overline{AB} \cong \overline{CD}$	9. ?
10. ?	10. Transitive Prop. of Congruence
11. ?	11. ?



24. Given: HANK is a rhombus. $\overline{HE} \cong \overline{FN}$

Prove: EAFK is a parallelogram.



S	R
① ~	① Given
② ∠H ≅ ∠N	② Opp ∠s of □ ≅
③ △HKE ≅ △NAF	③ SAS
④ $\overline{KE} \cong \overline{AF}$	④ CPCTC
⑤ $\overline{KN} \cong \overline{HA}$	⑤ Opp sides □ ≅
⑥ KN = HA, HE = FN	⑥ def of ≅
⑦ KN = KF + FN, HA = HE + EA	⑦ SAP
⑧ KF + FN = HE + EA	⑧ SALS
⑨ KF = EA	⑨ Subst
⑩ $\overline{KF} \cong \overline{EA}$	⑩ ∥ & ≅
⑪ EAFK is □	⑪ If 1 pair opp sides ≅ and ∥, then quad is □

25. Given: $\overline{DE} \parallel \overline{AV}$, $\Delta DAV \cong \Delta EVA$

Prove: DAVE is an isosceles trapezoid.

① ~	① Given
② $\overline{DA} \cong \overline{EV}$	② CPCTC
③ DAVE is an isos trap	④ def of isos. trap